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January 5, 1999

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

[14 CFR Part 25]

[Docket No. 28930; Amdt. No. 25-98]

RIN 2120-AF82

Revision of Gate Requirements for High-Lift Device Controls.

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule.

SUMMARY: This action amends the airworthiness standards for transport category airplanes to revise the requirements concerning gated positions on the control used by the pilot to select the position of an airplane's high-lift devices. The FAA is taking this action to update the current standards to take into account the multiple configurations of the high-lift devices provided on current airplanes to perform landings and go-around maneuvers. This final rule also harmonizes these standards with those being adopted by the European Joint Aviation Authorities (JAA).

EFFECTIVE DATE: March 10, 1999.

FOR FURTHER INFORMATION CONTACT: Don Stimson, FAA, Airplane and Flight Crew Interface Branch, ANM-111, Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue SW., Renton, WA 98055-4056; telephone (425) 227-1129; facsimile (425) 227-1320, e-mail Don.Stimson@faa.gov.

SUPPLEMENTARY INFORMATION:

Availability of Final Rule

An electronic copy of this document may be downloaded using a modem and suitable communications software from the FAA regulations section of the FedWorld electronic bulletin board service (telephone: 703-321-3339), the Government Printing Office's electronic bulletin board service (telephone: 202-512-1661), or the FAA's Aviation Rulemaking Advisory Committee Bulletin Board service (telephone: 800-322-2722 or 202-267-5948).

Internet users may reach the FAA's web page at <http://www.faa.gov/avr/arm/nprm/nprm.htm> or the Government Printing Office's webpage at <http://www.access.gpo.gov/nara> for access to recently published rulemaking documents.

Any person may obtain a copy of this document by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-9680. Communications must reference the amendment number or docket number of this final rule.

Persons interested in being placed on the mailing list for future notices of proposed rulemaking and final rules should request from the above office a copy of Advisory Circular (AC) No. 11-2A, Notice of Proposed Rulemaking

Distribution System, which describes the application procedure.

Small Entity Inquiries

The Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA) requires the FAA to report inquiries from small entities concerning information on, and advice about, compliance with statutes and regulations within the FAA's jurisdiction, including interpretation and application of the law to specific sets of facts supplied by a small entity.

The FAA's definitions of small entities may be accessed through the FAA's web page (<http://www.faa.gov/avr/arm/sbrefa.htm>), by contacting a local FAA official or by contacting the FAA's Small Entity Contact listed below.

If you are a small entity and have a question, contact your local FAA official. If you do not know how to contact your local FAA official, you may contact Charlene Brown, Program Analyst Staff, Office of Rulemaking, ARM-27, Federal Aviation Administration, 800 Independence Avenue, SW, Washington, DC 20591, 1-888-551-1594. Internet users can find additional information on SBREFA in the "Quick Jump" section of the FAA's web page at <http://www.faa.gov/avr/arm/sbrefa.htm> and may send electronic inquiries to the following Internet address: 9-AWA-SBREFA@faa.gov.

Background

Section 25.145(c) of 14 CFR part 25 of the Federal Aviation Regulations prescribes conditions under which it must be possible for the pilot, without using exceptional piloting skill, to prevent losing altitude while retracting the airplane's high-lift devices (e.g., wing flaps and slats). The intent of this requirement is to ensure that during a go-around from an approach to landing, the high-lift devices can be retracted at a rate that prevents altitude loss if the pilot applies maximum available power to the engines at the same time the control lever is moved to begin retracting the high-lift devices.

Prior to Amendment 25-23 to part 25, the § 25.145(c) requirement applied to retractions of the high-lift devices from any initial position to any ending position, including a continuous retraction from the fully extended position to the fully retracted position. In Amendment 25-23 to part 25, the FAA revised this requirement to allow the use of segmented retractions if gates are provided on the control the pilot uses to select the high-lift device position.

Gates are devices that require a separate and distinct motion of the control before the control can be moved through a gated position. The purpose of the gates is to prevent pilots from inadvertently moving the high-lift device control through the gated position. Gate design requirements were introduced into part 25 with Amendment 25-

23, which revised § 25.145(c) to allow the no altitude loss requirement to be met by segmented retractions of the high-lift devices between gated positions of the high lift devices. As amended by Amendment 25-23, § 25.145(c) specifies that the no altitude loss requirement applies to retractions of the high-lift devices between the gated positions and between the gates and the fully extended and fully retracted positions. In addition, the first gated control position from the landing position must correspond to the position used to establish the go-around procedure from the landing configuration.

In Notice of Proposed Rulemaking 97-9, which was published in the Federal Register on June 9, 1997 (62 FR 31482), the FAA proposed to update the gate design standards to clarify which positions of the high-lift device control should be gated and to harmonize these standards with those being proposed for the European Joint Airworthiness Requirements (JAR-25). The proposal contained in Notice 97-9 was originally developed by the Aviation Rulemaking Advisory Committee (ARAC) and presented to the FAA as a recommendation for rulemaking.

The Aviation Rulemaking Advisory Committee

The ARAC was formally established by the FAA on January 22, 1991 (56 FR 2190), to provide advice and recommendations concerning the full range of the FAA's safety-related

rulemaking activity. This advice was sought to develop better rules in less overall time using fewer FAA resources than are currently needed. The committee provides the opportunity for the FAA to obtain firsthand information and insight from interested parties regarding proposed new rules or revisions of existing rules.

There are over 60 member organizations on the committee, representing a wide range of interests within the aviation community. Meetings of the committee are open to the public, except as authorized by section 10(d) of the Federal Advisory Committee Act.

The ARAC establishes working groups to develop proposals to recommend to the FAA for resolving specific issues. Tasks assigned to working groups are published in the Federal Register. Although working group meetings are not generally open to the public, all interested parties are invited to participate as working group members. Working groups report directly to the ARAC, and the ARAC must concur with a working group proposal before that proposal can be presented to the FAA as an advisory committee recommendation.

The activities of the ARAC will not, however, circumvent the public rulemaking procedures. After an ARAC recommendation is received and found acceptable by the FAA, the agency proceeds with the normal public rulemaking

procedures. Any ARAC participation in a rulemaking package will be fully disclosed in the public docket.

Discussion of the Proposals

In Notice 97-9, the FAA proposed to update the gate design standards to clarify which positions of the high-lift device control should be gated and to harmonize these standards with those being proposed for the European Joint Airworthiness Requirements. First, the FAA proposed to re-codify the gate requirements of § 25.145(c) as a new § 25.145(d). Second, the FAA proposed to update and clarify the requirement that the first gated control position from the landing position corresponds to the configuration used to execute a go-around from an approach to landing. Third, the FAA proposed to clarify that performing a go-around maneuver beginning from any approved landing configuration should not result in a loss of altitude, regardless of the location of gated control positions. Fourth, the FAA proposed to add a statement to clarify that the "separate and distinct motion" required to move the high-lift device control through a gated position must be made at that gated position.

The existing gate requirements are contained in a separate, but undesignated paragraph at the end of § 25.145(c). To be consistent with current codification practices, the FAA proposed to re-codify these requirements

as a new § 25.145(d). Re-codification would not affect the content or intent of the requirement.

Currently, § 25.145(c) requires the first gated control position from the landing position to "correspond with the high-lift devices configuration used to establish the go-around procedure from the landing configuration." The wording of this requirement implies that airplanes have only one configuration that can be used for landing and one configuration that can be used to perform a go-around maneuver. Modern transport category airplanes, however, typically have multiple configurations that can be used for performing a landing or a go-around. Airplane manufacturers provide multiple landing and go-around configurations to optimize airplane performance for different environmental conditions (e.g., field elevation and temperature) and for non-normal situations (e.g., inoperative engines or systems).

To provide for airplanes with multiple landing and go-around configurations, the FAA proposed to revise the portion of the gate requirements relating to the placement of the first gated control position from the landing position by inserting the word "maximum" preceding "landing position" and by replacing "the high-lift devices configuration" and "the go-around procedure" with "a configuration of the high-lift devices" and "a go-around

procedure," respectively. The FAA considered allowing the location of the flap gates to be made independent of the go-around position; however, from a human factors standpoint, providing a gate at a go-around position assists the pilot in selecting the proper configuration for a maneuver that is usually unexpected and entails a high workload. The FAA considers that requiring a gate at every approved go-around position would also be undesirable. Too many gates would make it difficult for the pilot to move the control through high-lift device positions that might not be used during normal operations. For go-around maneuvers using a different high-lift device position than the position that is gated, the gate can still serve as a guide for selecting the proper configuration (e.g., the pilot could move the control to the gate and either forward or backward one or more positions).

The FAA also proposed a revision to Advisory Circular (AC) 25-7, "Flight Test Guide for Certification of Transport Category Airplanes" (June 17, 1997, 62 FR 32852) to provide additional guidance regarding criteria for locating the gate when the airplane has multiple go-around configurations.

Regardless of the location of any gates, initiating a go-around from any of the approved landing configurations should not result in a loss of altitude. Therefore, the FAA proposed to further revise the existing gate standards to

require applicants to demonstrate that no loss of altitude will result from retracting the high-lift devices from each approved landing position to the position(s) corresponding with the high-lift device configuration(s) used to establish the go-around procedure(s) from that landing configuration.

The existing § 25.145(c) also requires that a separate and distinct movement of the high-lift device control must be made to pass through a gated position. The FAA proposed to further clarify the gate design criteria in the proposed § 25.145(d) to specify that this separate and distinct movement can occur only at the gated position. This provision would ensure that the pilot receives tactile feedback when the control reaches a gated position. Although the FAA has always interpreted the current requirements in a manner consistent with this provision, this proposal will assist applicants by clarifying the part 25 design requirements for gated high-lift device control positions.

The amendments proposed in Notice 97-9 were harmonized with proposed amendments to JAR-25. The Joint Aviation Authorities published Notice of Proposed Amendment (NPA) 25B-238 on June 20, 1997, which, in combination with the proposed part 25 changes, would achieve complete harmonization of the affected portions of part 25 and JAR-25.

Discussion of Comments

Very few comments were received on the part 25 rule changes proposed by the FAA in Notice 97-9. Three of the commenters, which were organizations represented in the ARAC process that developed these proposals, expressed their support for the proposals. One of these commenters noted that the ARAC process was highly successful in developing a better proposal than what was envisaged at the beginning of the process, did so in a very short period of time, and ended up with a proposal that was unanimously supported by all the participants. This commenter expressed hope that the FAA will continue to make improvements in the process to develop rules in less overall time.

One commenter, whose organization was also represented in the ARAC deliberations, expressed support for the proposals, but also suggested several changes be made. First, the commenter notes that § 25.145 uses both terms "wing flaps" and "high lift devices." The commenter suggests standardizing on the single term "high lift devices" throughout.

Second, the commenter alleges that the FAA proposal differs from the JAA proposal relative to the position of the first gated position from the maximum landing position. The commenter claims that the FAA proposal would require the gate to correspond with the configuration used to establish

a go-around procedure from "the" landing position, implying that the landing position is the maximum position. The commenter notes that the JAA proposal refers to "a" landing position, which the commenter believes allows the optimum gate position to be chosen when there are multiple landing configurations.

Third, the commenter notes that there is no reference within part 25 regarding the relationship between the configuration for the missed approach (§§ 25.101(g) and 25.121(d)) and the configuration used for go-around (proposed § 25.145(d)). Since these configurations can be different, the commenter believes that the definitions and procedures should be clarified. The commenter did not fully explain why such clarification is needed, nor were any specific suggestions provided.

Last, the commenter notes that there could be a landing flap position at a lesser flap angle than the gated go-around position. Under the proposed rules, there would not be a requirement to have any gates between that position and the clean configuration. This could lead to an inadvertent retraction of the high lift leading edge devices (e.g., slats) during a go-around, which the commenter believes may be a hazardous event even if the "don't sink" requirement is met.

Although the FAA agrees in principle with the commenter's first suggestion, to standardize on a single term, this issue is outside the scope of the proposed rulemaking. The terms "flaps," wing flaps," and "high lift devices" are used in other part 25 sections in addition to § 25.145, and any attempt to standardize these terms should include a thorough review of these other sections. The objective of this rulemaking is to clarify and harmonize the requirements regarding gates on the high lift device control, taking into account current airplane designs.

Regarding the commenter's second suggestion, the commenter is incorrect in stating that the FAA and JAA proposals are different. The FAA and JAA proposals are exactly the same; they both contain the wording that the commenter prefers. In fact, it is the existing § 25.145(c) and JAR 25.145 that contain the wording the commenter is objecting to, which the FAA and JAA proposed to revise due to the issue raised by the commenter.

The commenter is correct in stating that there is no reference within part 25 regarding the relationship between the configuration for the missed approach (used to comply with §§ 25.101(g) and 25.121(d)) and the configuration used for go-around (used to comply with § 25.145(d)). Although a single configuration is typically specified by the applicant for both situations, the commenter points out that this is

not a part 25 requirement. The FAA disagrees that further clarification of the definitions and procedures associated with the missed approach and go-around configurations is necessary. The configuration associated with a missed approach is specifically defined in § 25.121(d), which refers to an approach configuration prior to selection of the landing configuration. The go-around configuration, which is used to show compliance with § 25.145(d), is the climb configuration referenced in the procedures for a balked landing from the landing configuration. The references to and relationships between these configurations have not been changed by this rulemaking.

The issue brought up by the commenter's last suggestion was considered during the development of the proposed rule. However, a specific requirement to place a gate at the position preceding the one at which the wing's leading edge high lift devices (e.g., slats) retract was considered to be too prescriptive. The performance effect of retracting the wing's leading edge high lift devices can vary significantly, depending on the design of the high lift system on the particular airplane. Other than the "no loss of altitude" provision of § 25.145(c), it is difficult to quantify a minimum performance requirement that would appropriately address any safety concerns with an inadvertent leading edge device retraction. The FAA

considers the "no loss of altitude" criterion, coupled with industry design practice, to adequately address this issue.

A commenter who was not involved in the ARAC process leading to the proposed amendment suggests that a gate should be required at all approved go-around positions of the high lift devices, rather than at "a" go-around position. This commenter believes that from a human factors standpoint the benefits of maintaining a consistent procedure for selecting the go-around configuration outweigh any drawbacks associated with having too many gates.

The FAA addressed this issue in the preamble of the proposed amendment (which is repeated in the background discussion above). The FAA considers that requiring a gate at every approved go-around position would be undesirable. Too many gates would make it difficult for the pilot to move the control through high-lift device positions that might not be used during normal operations. For go-around maneuvers using a different high-lift device position than the position that is gated, the gate can still serve as a guide for selecting the proper configuration (e.g., the pilot could move the control to the gate and either forward or backward one or more positions).

Although the FAA generally agrees that from a human factors standpoint a consistent operational procedure is desirable, this objective would not necessarily be achieved

even if the commenter's suggestion were adopted. For a typical transport category airplane with multiple go-around positions requiring multiple gates, the procedure for selecting the desired go-around configuration may involve moving the selector to the first gate, through a gate to another gate, or through multiple gates to the gate corresponding to the desired configuration. Such a procedure is roughly equivalent to moving the control to the gate and either forward or backward one or more positions to select the desired configuration. The FAA does not consider the presence of multiple gates to provide enough of an enhancement to the flightcrew's ability in selecting the proper configuration to outweigh the potential drawbacks associated with the need to negotiate the control through multiple gates during normal operations.

In light of the foregoing discussion, the amendment is adopted as proposed.

Final Regulatory Evaluation, Initial Regulatory Flexibility Determination, and Trade Impact Assessment

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to

analyze the economic impact of regulatory changes on small entities. Third, the Office of Management and Budget directs agencies to assess the effects of regulatory changes on international trade. And fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104-4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or tribal governments, in the aggregate, or by the private sector, of \$100 million or more annually (adjusted for inflation). In conducting these analyses, the FAA has determined that this rule: (1) will generate benefits that justify its costs and is not a "significant regulatory action" as defined in the Executive Order; (2) is not "significant" as defined in DOT's Regulatory Policies and Procedures; (3) will not have a significant impact on a substantial number of small entities; (4) will lessen restraints on international trade; and (5) does not contain a significant intergovernmental or private sector mandate. These analyses, available in the docket, are summarized below.

Regulatory Evaluation Summary

U.S. manufacturers currently design high-lift device controls in compliance with the final rule. Industry representatives indicate that U.S. manufacturers will not

have to redesign high-lift device controls on either newly certificated airplanes or derivatives of currently certificated models. The costs of the rule, therefore, will be negligible. The FAA solicited information from manufacturers of transport category airplanes concerning any possible design changes and associated costs that would result from the proposed amendment. No comments were received concerning these matters.

The primary benefit of the rule is the clarification of gate design standards of high-lift device controls. A second benefit is the harmonization of FAR certification requirements for controls on high-lift devices with JAR certification requirements, and this benefit may result in cost savings to manufacturers of transport category airplanes in the United States and in JAA countries. Although the FAA is unable to quantify these benefits, the FAA has determined that these benefits exceed the negligible costs of the final rule.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to

regulation." To achieve that principle, the Act requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. The Act covers a wide-range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a proposed or final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a regulatory flexibility analysis as described in the Act.

However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 act provides that the head of the agency may so certify and an regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

For manufacturers, a small entity is one with 1,500 or fewer employees. No transport category airplane manufacturer has 1,500 or fewer employees, thus there are no affected small entities. In addition, the rule has negligible costs. Consequently, the FAA certifies that the rule will not have

a significant economic impact on a substantial number of small transport category airplane manufacturers.

International Trade Impact Assessment

Consistent with the Administration's belief in the general superiority, desirability, and efficacy of free trade, it is the policy of the Administrator to remove or diminish, to the extent feasible, barriers to international trade, including both barriers affecting the export of American goods and services to foreign countries, and those affecting the import of foreign goods and services into the United States.

In accordance with that policy, the FAA is committed to develop, as much as possible, its aviation standards and practices in harmony with its trading partners. Significant cost savings can result from this, both to American companies doing business in foreign markets, and foreign companies doing business in the United States.

This rule is a direct action to respond to this policy by increasing the harmonization of the U.S. Federal Aviation Regulations with the European Joint Aviation Requirements. The result will be a positive step toward removing impediments to international trade.

Unfunded Mandates Reform Act

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995,

requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal agency regulation that will impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of \$100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

The rule does not contain any Federal intergovernmental or private sector mandate. Therefore, the requirements of Title II of the Unfunded Mandates Reform Act of 1995 do not apply.

Federalism Implications

The regulations adopted herein will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this rule will not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with ICAO Standards and Recommended Practices to the maximum extent practicable. The FAA has determined that this rule does not conflict with any international agreement of the United States.

Regulations Affecting Intrastate Aviation in Alaska.

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the Administrator, when modifying regulations in Title 14 of the CFR in a manner affecting intrastate aviation in Alaska, to consider the extent to

which Alaska is not served by transportation modes other than aviation, and to establish such regulatory distinctions as he or she considers appropriate. Because this final rule applies to the certification of future designs of transport category airplanes and their subsequent operation, it could affect intrastate aviation in Alaska. The Administrator has considered the extent to which Alaska is not served by transportation modes other than aviation, and how the final rule could have been applied differently to intrastate operations in Alaska. However, the Administrator has determined that airplanes operated solely in Alaska would present the same safety concerns as all other affected airplanes; therefore, it would be inappropriate to establish a regulatory distinction for the intrastate operation of affected airplanes in Alaska.

List of Subjects in 14 CFR part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration (FAA) amends part 25 of Title 14, Code of Federal Regulations (14 CFR part 25) as follows:

**PART 25 - AIRWORTHINESS STANDARDS - TRANSPORT CATEGORY
AIRPLANES**

1. The authority citation for part 25 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701-44702, 44704.

2. Section 25.145 is amended by revising paragraph (c) introductory text, revising the text following paragraph (c)(3), and designating that text as paragraph (d) to read as follows:

§ 25.145 Longitudinal control.

* * * * *

(c) It must be possible, without exceptional piloting skill, to prevent loss of altitude when complete retraction of the high-lift devices from any position is begun during steady, straight, level flight at $1.1 V_{S1}$ for propeller powered airplanes, or $1.2 V_{S1}$ for turbojet powered airplanes, with--

(1) * * *

(2) * * *

(3) * * *

(d) If gated high-lift device control positions are provided, paragraph (c) of this section applies to retractions of the high-lift devices from any position from the maximum landing position to the first gated position, between gated positions, and from the last gated position to the fully retracted position. The requirements of paragraph (c) of this section also apply to retractions from each

approved landing position to the control position(s) associated with the high-lift device configuration(s) used to establish the go-around procedure(s) from that landing position. In addition, the first gated control position from the maximum landing position must correspond with a configuration of the high-lift devices used to establish a go-around procedure from a landing configuration. Each gated control position must require a separate and distinct motion of the control to pass through the gated position and must have features to prevent inadvertent movement of the control through the gated position. It must only be possible to make this separate and distinct motion once the control has reached the gated position.

Issued in Washington, DC, on February 3, 1999.

/s/ Jane F. Garvey

Adminisrator